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REMARKS

Claims 1 and 3-22 are pending in the present application. Claims 1 and 3-22 are rejected under 35 U.S.C. 103(a). The rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Rejections over Thompson (U.S. 5,037,174) in view of Mathyssek et al. (U.S. 4,589,897)

Claims 1, 6, 7, 10, and 11 were rejected. In rejecting claim 1, the Examiner states, in part, that "Thompson does not teach that the modifying comprises removing material from at least one end of the optical fiber member. Mathyssek teaches removing material from an optical fiber to form a lens tip at the end of a continuous taper (Figures 1-4 and column 2, line 40 – column 4, line 19)."

Applicant respectfully disagrees. Mathyssek discloses forming "dynamically balanced constrictions" (col. 3, lines 20-48; Figs. 1-4) and forming "tapers with refractive lenses" (col. 3, line 49 to col. 4, line 19; Figs. 1-4). In forming "dynamically balanced constrictions", the fiber 1 is "topically or locally softened between the grooves 3 and 4" and then "stretched to provide a constriction 11 in the softened region." (Col. 3, lines 34-41; Fig. 2). The softening is accomplished by applying heat to the region of the fiber. (Col. 3, lines 34-39). When a desired constriction diameter is obtained, the heat is turned off, which hardens the constricted area, resulting in "a constriction 11 in the fiber 1 as shown in FIGS. 2 and 3." (Col. 3, lines 42-48). Thus, no material is removed or lost during this process.

Mathyssek also discloses a process for "the manufacture of tapers with refractive lenses." (Col. 3, lines 49-50). Here, when the constriction 11 reaches the desired diameter, the heat is left on, but the pulling or tension stops. (Col. 3, lines 49-55; Fig. 2). Since the arc or heat remains on, the constriction 11 is further deforms and forms "another local constriction 12 . . . [which] tends to transversely separate the first constriction 11." (Col. 3,

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2033 Gateway Place
Suite 400
San Jose, CA 95110
(949) 752-7040
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lines 55-66; Fig. 2). The constriction then parts or separates from the heat, and the ends deform to form rounded ends of a desired curvature. (Col. 4, lines 1-13). The heat is then turned off to complete the lens formation. (Col. 4, lines 13-19). Thus, as seen from this and Fig. 2, no material is removed or lost during the process, as the fiber is simply heated and pulled to form constrictions 11 and 12, and continual heat is applied to separate the fiber and form the lens.

Accordingly, no where does Mathyssek teach or even suggest that material is removed from "at least one end of the optical fiber member", as recited in claim 1. The exposure to the arc energy (or heat), along with or without the pulling action (or tension), results in the ends tapering and forming aspherical lenses. (See, e.g., Fig. 2).

Claims 6, 7, 10, and 11 depend on claim 1 and are thus patentable over Thompson in view of Mathyssek for at least the same reasons as claim 1.

Rejections over Thompson in view of Mathyssek and Yamane et al. (U.S. 5,459,803)

Claims 3-5, 13-17, and 20 were rejected. Yamane is cited, inter alia, for "etching the at least one end of the optical fiber member". Applicant contends that the obviousness rejection under 35 U.S.C. § 103 cannot be established by combining the teachings of Thompson and Mathyssek with Yamane et al. because there is no suggestion or motivation in the cited references for the combination. Details as to why the combination is not proper has been argued and apparently overcome in Applicant's Pre-Appeal Brief Request for Review. The arguments would apply equally to Mathyssek since Mathyssek, like Thompson, is directed to forming an optical fiber having an extension formed by pulling the fiber, which is then rounded into an aspherical shape using arc energy. Also, similar to Thompson, Mathyssek does not disclose any point in the fiber formation in which the fiber has a

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2033 Gateway Place
Suite 400
San Jose, CA 95110
(949) 752-7040
FAX (949) 752-7049

truncated cone shape or a flattened shape. The arguments are repeated, in light of Mathyssek, below for the sake of completeness.

Yamane discloses an optical fiber 10 comprising "a core 11 made of a quartz-based glass and a clad 12 made of another quartz-based glass which surrounds the core." (Yamane, col. 5, lines 12-14; Fig. 4). As shown in Figs. 4-8 and 10-14, the optical fiber has an end surface that is "flat and perpendicular" to the axial direction of the fiber. (Yamane, col. 5, lines 19-29, col. 6, lines 4-9, col. 7, lines 54-59, col. 8, lines 23-27, 33-35, and 39-43, and col. 9, lines 19-30). In other words, the optical fiber of Yamane has a significant clad portion, all of which is flat at the end of the fiber. A key objective in Yamane is having an "optical fiber with a lens which is free of any tapered portion". (Yamane, col. 3, lines 26-28 and col. 6, lines 4-8). At the middle of the fiber, the core 11 projects out from the flat portion of the clad that is either a curved or rounded shape as shown in Figs. 4-7 and 10-14, a truncated cone shape as shown in Fig. 8, or a conical shape as shown in Fig. 14. Thus, Yamane discloses a quartz-based optical fiber having a central core portion that is shaped (round, truncated cone, or conical) and an outer clad portion that is flat. Etching using HF acid provides a higher etching speed in the core portion than in the clad portion "to form a projecting core of a truncated cone shape on the end surface". (Yamane, col. 4, lines 14-18 and col. 8, lines 28-35) (emphasis added). Thus, the etching of Yamane is to form a flattened portion on the end surface.

On the other hand, Thompson and Mathyssek are directed to forming an optical fiber having an extension formed by pulling the fiber, where the extension is then rounded into an aspherical shape using arc energy.

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2033 Gateway Place
Suite 400
San Jose, CA 95110
(949) 752-1040
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Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But obviousness "cannot be established by combining the teachings

of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." ACS Hosp. Sys. Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Thus, "teachings of references can be combined only if there is some suggestion or incentive to do so." Id. Applicant, thereby, contends that there is no suggestion or incentive to combine Thompson and Mathyssek with Yamane because Thompson and Mathyssek are directed to very different processes for forming a lens on an optical fiber, as compared with Yamane.

Thus, for an obviousness combination, the "critical inquiry is whether 'there is something in the prior art as a whole to suggest the desirability, and thus the obviousness of making the combination.'" Fromson v. Advance Offset Place, Inc., 755 F.2d 1549, 1556, 225 USPQ 26, 31 (Fed. Cir. 1985) *quoting* Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1453, 1452, 221 USPQ 481, 488 (Fed. Cir. 1984). In other words, the "mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Gordon, 773 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) *citing* Carl Schenck, A.G. v. Nortron Corp., 713 F.2d 782, 787, 218 USPQ 698, 702 (Fed. Cir. 1983). In the present case, there is not suggestion of the desirability of a combination of Thompson and Mathyssek with Yamane because, as mentioned above, Thompson/Mathyssek and Yamane use different processes to achieve different types of lens shapes, i.e., aspherical versus truncated cone. Etching of Yamane is to create a truncated cone shape; the pulling and heating of Thompson and Mathyssek is to create an extension and an aspherical shape, respectively, at the end of the fiber. As such, there would be no reason to etch the fiber using HF acid. Applicant would not even know how to modify the process of Thompson and Mathyssek to use HF acid to etch the fiber, as the invention of Thompson and Mathyssek is to first pull a fiber and separate the fiber (by pulling in Thompson and heating in Mathyssek) into two parts to create an extension

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2033 Gateway Place
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San Jose, CA 95110
(949) 732-7040
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at the two ends and to then expose the ends to arc energy to smooth out the extension and form an aspherical lens surface. Accordingly, Thompson and Mathyssek do not suggest to one skilled in the art the desirability to combine with Yamane, and in fact, may not even make it possible to practice the invention of Thompson and Mathyssek if the combination with Yamane is actually practiced.

Furthermore, the "statute, §103, requires much more, i.e., that it would have been obvious to produce the claimed invention at the time it was made without the benefit of hindsight." Orthokinetics, Inc. v. Safety Travel, Chairs, Inc., 806 F.2d 1565, 1575, 1 USPQ2d 1081, 1087 (Fed. Cir. 1986). "When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself." Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985) *citing* ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577 & n.14, 221 USPQ 929, 933 & n.14 (Fed. Cir. 1984). Applicant believes the motivation to combine Thompson and Mathyssek with Yamane is derived from Applicant's invention since there is no suggestion in the cited references for the desirability of such a combination, as discussed above.

Therefore, because Applicant contends that the combination of Thompson and Mathyssek with Yamane is improper, Applicant believes claims 3-5, 13-17, and 20 are patentable over Thompson and Mathyssek in view of Yamane.

Rejections over Thompson in view of Mathyssek and Cesaroni (U.S. Pub. 2003/0029040)

Claims 8 and 9 were rejected. Cesaroni is cited for disclosing removing and heating material both ends of the fiber, but does not teach removing material from the fiber to form continuously tapered ends and then applying heat to form a continuously tapered lens surface. Because Cesaroni does not remedy the deficiencies of Thompson and Mathyssek as discussed

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2033 Gateway Place
Suite 400
San Jose, CA 95110
(949) 732-7060
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above with respect to claim 1, claims 8 and 9, which depend on claim 1, are patentable over Thompson and Mathyssek in view of Cesaroni.

Rejection over Thompson in view of Mathyssek and Grasso III et al. (U.S. 6,375,651)

Claim 12 was rejected. Grasso, III et al. was cited for disclosing moving the modified end of the fiber to a spark. However, Grasso, III et al. does not remedy the deficiencies of Thompson and Mathyssek as applied to claim 1 and discussed above, i.e., removing material from the fiber to form continuously tapered ends and then applying heat to form a continuously tapered lens surface. Therefore, because claim 12 depends on claim 1, claim 12 is patentable over Thompson and Mathyssek in view of Grasso, III et al.

Rejections over Thompson in view of Mathyssek, Yamane, and Cesaroni

Claims 18 and 19 were rejected. Claims 18 and 19 depend on claim 13. As discussed above, claim 13 is believed patentable over Thompson and Mathyssek in view of Yamane. Cesaroni is cited for disclosing removing and heating material both ends of the fiber, but does not remedy the deficiencies of Thompson, Mathyssek, and Yamane. Therefore, claims 18 and 19 are patentable over the cited references.

Rejections over Thompson in view of Mathyssek, Yamane, and Wei et al. (U.S. Pub. 2004/0134884)

Claims 21 and 22 were rejected. Wei et al. is cited for disclosing oil placed on the top surface of an etching liquid. Wei et al. discloses coating a fiber with a "relatively thick coating layer 330" and then immersing the end of the fiber into an HF solution to form a tip of a probe. (Wei, paragraphs [0022] to [0025]; Figs. 3A-3C). Thus, in general, Wei discloses forming an end of a fiber by immersion in an etching liquid. However, as discussed above

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(949) 752-7040
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with respect to Yamane, there is no motivation in Thompson or Mathyssek to use an HF solution to etch away material to form a lens. In addition, Wei discloses using HF solution to form the final probe tip, which is vastly different than Applicant's invention recited in claims 1 and 13, in which material is first removed to modify a fiber end and then the lens surface is formed by heating the modified end.

Therefore, because claims 21 and 22 depend on claims 1 and 13, respectively, claims 21 and 22 are patentable over the cited references.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections of the claims 1 and 3-22 under 35 U.S.C. § 103(a).

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2033 Gateway Place
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San Jose, CA 95110
(949) 752-7040
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CONCLUSION

For the foregoing reasons, Applicant believes pending claims 1 and 3-22 are allowable, and a notice of allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Attorney at (949) 752-7040.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office, Fax. No. 571-273-8300, on the date shown below.

Monique Butler — November 17, 2006 (Date of Signature)

Respectfully submitted,

Tom Chen
Attorney for Applicant
Reg. No. 42,406

LAW OFFICES OF
MACPHERSON KWOK
CHEN & HEID LLP

2033 Gateway Place
Suite 400
San Jose, CA 95110
(949) 752-7040
FAX (949) 752-7049